



How does government spending and opening-up influence Chinese consumer spending?

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1. Introduction

The consumption level of Chinese residents has been at a relatively low level since the 1990s. However, after the international financial crisis, the expansion of domestic demand based on the level of residents' consumption has become a realistic choice for the transformation of China's economic growth mode and sustainable development. At this stage, because the sustained and healthy growth of the household consumption level is hardly driven entirely by market forces, the Chinese government has implemented a matching fiscal policy and monetary policy to stimulate rapid growth of household consumption levels and maintain stable economic growth (Zhang et al., 2009).

As the main policy measures of China's fiscal policy have always been to increase government expenditures, the effectiveness of government expenditures in stimulating household consumption levels has become one of the most important issues for the government and academia. In addition, China's opening up policy has also had a profound impact on China's economy, so the impact of opening up on residents' consumption is also worthy of attention (Li, 2010). In fact, looking back at the development history since China's economic reform and opening up, we can see that the dominant role of the government in the economy and the opening up to the outside world are two notable features of China's transitional growth model. These two characteristics form the core of China's economic growth model for more than 30 years. Therefore, how the role of the government and the opening-up policy affects the consumption of the residents has become the focus of attention. However, by summing up the existing literature, it is not difficult to find that there are many controversies regarding the study of China's domestic consumption level. Most studies are based on consumption theory

and international comparisons. This dissertation plans to combine the characteristics of consumer research and China's transitional growth model to analyze how government spending and opening up affect Chinese household consumption.

In this dissertation, there are two main reasons why the government's role (representing the government's leading role as the ratio of government expenditure to regional GDP) and the opening to the outside world are analyzed together: Firstly, the most prominent manifestation of China's transitional characteristics is the government's leading role and influence on the economy. This effect is omnidirectional and cannot be ignored. Therefore, how this influence affects domestic consumption is worthy of attention. Secondly, China's transformational growth over the past 30 years since the beginning of reform and opening up has been closely linked with investment promotion under the opening-up policy. Then, how does this scenario affect consumer spending? Based on the above two reasons, we will combine government expenditure and reform and opening up to study domestic consumption, which will be more targeted and realistic. Therefore, this dissertation will explore the relationship between government spending, opening up, and consumer spending.

2. Literature review

Economists put forward their own views and discourses on consumer spending, consumption structure and their development trends in the process of examining social consumption. With the introduction and development of various theories, scholars from various countries have explored various possible factors that influence consumer behavior. Among them, income is one of the most important influencing factors, and demographic factors such as the family's various assets and their composition, the age of the head of

the household, and the family's demographic structure have also become topics for discussion.

2.1 Factors Affecting Household Consumption Expenditure

Early studies of consumer expenditure behaviors were mostly based on deterministic consumption theory. Most of them considered income as the main factor affecting consumer expenditure behavior. Further, a large number of empirical studies have also explored the effects of persistent income and temporary income on consumer spending (Campbell and Deaton, 1989; Browning and Lusardi, 1996). With the development of uncertain consumption theory, more and more scholars focus on how income uncertainty affects consumer spending (Guiso, Jappelli and Terlizzese, 1992). At the same time, many scholars applied micro-data analysis to verify that the wealth effects (including income effects and asset effects) change with different families. Age, housing ownership and household asset structure are all important factors that influence the behavior of household consumption expenditure.

(1) Effect of income on consumer behavior

Empirical research on the impact of income on consumer spending is based on time series or panel data. It analyzes the impact of different types of income on consumer spending, or analyzes the differences in marginal propensity to consume among different income groups. Because microscopic data is difficult to obtain, early empirical studies are mostly macroscopic. Friedman (1957) used the American time series data to verify the adaptability of the simple model under Permanent income Hypothesis (PIH). Later, Darby (1975) used the setting form of the consumption function under the PIH to discuss the effects of temporary income and sustainable income on non-durable goods consumption expenditure and durable goods

consumption expenditure.

With the deepening of the study of uncertainty consumption theory, many scholars have begun to conduct empirical research based on the uncertainty consumption theory. Under the uncertainty consumption theory, when there are risks, when consumers decide the consumption route, they must not only consider the amount of permanent income, but also consider the change of lasting income (that is, the risks and uncertainties they faced). Zeldes (1989) found that under the constant relative risk aversion (CRRA) utility function, consumers have obvious precautionary saving motives, especially for those groups with low financial assets and unstable labor income. At the same time, these consumers are clearly more sensitive to the predicted risk of income and are less responsive to unpredictable income risks. Caballero (1990) pointed out that risk is mainly reflected in changes in labor income. If the consumer does not care about the risk, he will determine the change in consumer spending based on changes in the permanent income. There is no oversmoothness at this time. However, if risk is taken into account, consumers must take precautionary saving behaviors at the same time to avoid risks. At this time, they will show excessive smoothness. According to the intertemporal budget constraint theory, excessive sensitivity can also be established. However, Browning and Lusardi (1996) pointed out that just as many people are not affected by the constraints of liquidity, many publics make preventive saving motives less important because they have enough assets or because of the improvement of the social security system.

With the gradual enrichment of micro-data, more and more scholars have studied the differences in consumer expenditure behaviors of different income groups at the micro level. Song (1981) discusses the adaptability of the model in developing countries under the Life Cycle Hypothesis and examines the impact of industrialization and urbanization processes on consumer spending and savings behavior. At the same time, he also pointed

out through empirical analysis that distinguishing between rural residents, urban workers and urban vocational colleges in consumer spending and savings behavior, and then establish a corresponding model, can better explain the consumer spending behavior of poor countries. He found that the rural residents' consumption expenditures and saving behavior are very different from those of urban workers. The marginal propensity to consume of rural residents' income is 0.85, which is much higher than the marginal consumption propensity of urban residents (0.64-0.67). Dynan, Skinner and Zeldes (2004) and Carroll (2008) also empirically pointed out that there is a strong correlation between household consumption or saving behavior and lifetime income. Therefore, if the model is directly estimated without distinguishing income groups, it will lead to overestimation due to bias.

From the study of the consumption structure, many scholars have empirically analyzed the consumption structure of different income groups on the basis of differentiating income groups. Blundell, Pashardes, and Weber (1993) used micro data and macro data to analyze the factors affecting the consumption structure and compared the consumption structure of different income groups. The research results confirm that the use of micro data for empirical analysis can control family heterogeneity. Therefore, the use of micro data analysis on the factors affecting the consumption structure is superior to the use of macro data. In addition, it also confirms that there are differences in the expenditure elasticity and price elasticity of different income groups for various commodities, and the expenditure elasticity and price elasticity of low-income groups are usually higher than those of high-income groups. Jones and Mustiful (1996) used micro-panel data to analyze the elasticity of demand for five categories of breakfast foods in two regions at different economic levels. The results show that low-income groups have a higher demand elasticity for the four types of foods in the five categories of food, and there is little price elasticity for snacks.

Although many scholars classify samples into income groups and study the influencing factors of consumption structure of different income groups, there are always technical obstacles to how to divide income groups. Jensen and Manrique (1998) proposed the method of grouping samples based on family income using Engel's equations, which enabled families with similar consumption structures to be grouped into one group, which laid a methodological foundation for analyzing the consumption structure of different income groups. They also established an AIDS model that incorporates demographic features and uses family data to analyze the demand structure to estimate the structural parameters of the demand equation. Many households in low-income groups have zero consumption for certain food categories. Endogenous conversion regression can solve this problem, so that the estimation of demand parameters for low-income groups is unbiased and consistent. The estimation of the demand parameters of other income groups directly adopts the standard irrelevant regression method. The results show that the consumption demand of various commodities is related to the price, income, and demographic variables of households with medium-high income and high-income households; Households with lower-middle-income households have a demand for various types of commodities that are only related to income and prices; The consumption demand of various types of commodities by low-income families is only related to income and the prices of rice and fish.

(2) Impact of assets on consumer behavior

From the impact of (various) assets on consumer spending, some scholars have used macro data to compare the effects of assets in different regions and countries internationally. Altissimo et al. (2005) discussed theoretically the asset prices and asset effects in European countries and other important economies and conducted corresponding empirical analysis. Through basic theoretical analysis, they reveal that the impact of assets on

consumer spending depends on the length of the planning period (which may be the entire life cycle), the strength of the gifted motivation, and the risky return on wealth. By calculating short-term budget constraints, the estimated value of possible marginal propensity to consume is between 0.03 and 0.1. The ratio of total financial assets to consumer expenditures based on international data varies from country to country.

Sousa (2009) estimated the impact of assets on consumer spending in Europe as a whole. The results show that the effect of financial assets is relatively large and obvious, while the effect of housing assets is not obvious, and consumption growth continues and depends on the stock market. In addition, the short-term and long-term effects of assets on consumer spending are different. In order to analyze the impact of different financial assets on consumer spending, they divided financial assets into several major components. The study found that cash and current savings have a greater asset effect, and consumer spending is very sensitive to financial lending. Skudelny (2009) also targeted the European region and classified assets into financial assets and housing assets, and studied the impact of these two assets on consumer spending. It was found that the marginal propensity to consume of financial assets estimated using European macro data was much higher than that based on panel data. The estimation of the marginal propensity to consume of actual housing assets using time-series data is close to the estimate of the marginal propensity to consume of nominal housing assets. However, the marginal consumption propensity of real housing assets obtained by panel data estimation is much higher than the marginal consumption propensity of nominal housing assets. Slacalek (2009) used 16 countries' financial and housing assets data to explore the impact of assets on consumer spending. The study found that the average marginal propensity to consume of assets was only 0.05, and the average marginal propensity to consume of assets of the more developed countries in the

lending market were stronger, between 0.04 and 0.06. For countries other than the United Kingdom and the United States, the marginal propensity to consume in housing assets tends to be less than the marginal propensity to consume in financial assets.

The marginal propensity to consume of assets based on micro-level data may be lower than that based on macro-level data. Maki and Palumbo (2001) used the US Consumer Finance Survey microdata (SCF) and related macro data to estimate the marginal propensity to consume for different income groups. The results of the study show that in the late 1990s, high-income groups received the most benefit from the stock market. As a result, the savings rate has dropped significantly. However, this effect is only concentrated in high-income groups. Therefore, the growth in consumption in macro data seems to come from only these households.

However, the study of Maki and Palumbo may be a special case. On the contrary, many scholars have obtained different research results. Bover (2005) used data from the Spanish Family Finance Survey to study the asset effects of consumer spending. In order to control the potential endogeneity of family assets, he used house price variables and household characteristics information as instrumental variables. The study found that homeowners had the greatest asset effects, followed by renters, while financial asset effects were often small and insignificant. Bostic, Gabel, and Painter (2005)'s study in the United States and Sierminska and Takhtamanova's (2007) studies in Finland, Canada, and Italy also show that the marginal propensity to consume of financial assets is relatively small and is usually statistically insignificant. However, with the financial reforms, changes have taken place in the structure of household assets, and the reform of the pension insurance system has led to the need for individuals to protect their own retirement income through private savings. Therefore, the impact of financial assets on consumer spending has become more pronounced over time.

Grant and Peltonen (2005) used Italian household panel data from 1989 to 2002 to study the impact of assets in the Italian stock market and real estate market on consumer spending on household durable goods. The results show that all households have a similar response to real estate and stock market returns. According to the scale of household assets, the family is divided into three different asset groups and estimated separately. It is found that the three groups of households all have significant estimates of the marginal propensity to consume, and the low-asset households have the highest marginal propensity to consume, which is about 0.26. While the high-asset households have the lowest marginal propensity to consume, which is between 0.13 and 0.16. Guiso, Paiella, and Visco (2005) also used Italy's detailed house price data for years to calculate consumer's return on assets and losses, and discussed whether changes in housing prices affect consumer spending. The study found that consumer spending is indeed affected by capital gains, and the marginal propensity to consume for the gains on real housing assets is approximately 0.02. Different consumer groups have different responses to capital gains. For homeowners, consumer spending increases with rising house prices, and the marginal propensity to consume for gains on real estate is approximately 0.04. For renters, the increase in rental costs often leads to a reduction in consumer spending and an increase in savings. The marginal propensity to consume of the renter's net assets is 0.04 to 0.06, which is higher than the marginal propensity to consume of the homeowner's net assets of 0.02. Campbell and Cocco (2007) used British microdata to explore the response of household consumption expenditures to housing prices. The results show that the effect of housing prices on consumer spending is greatest for the elderly head of households, while the impact of housing prices on consumer spending is minimal for young renters, which is not significantly different from zero. This conclusion is consistent with the different asset effects between different groups. This conclusion is consistent with the conclusion that different groups have

different asset effects. In addition, the study also pointed out that regional housing prices have affected consumption growth in the region, and predictable changes in housing prices are consistent with predictable changes in consumption, especially for households subject to borrowing constraints. But this impact is generated by the country rather than by the price of housing in the region, and it is important for homeowners and renters, which means that housing prices in the UK are related to the overall state of the financial market. These studies show that the impact of housing asset prices on consumer spending varies between home owners and renters. When housing prices rise, consumer spending on the latter increases, while the former tends to increase savings.

In addition, there are also differences in the marginal propensity to consume for households with different asset-liability ratios. Disney, Bridges, and Gathergood (2006) used the British Household Panel Survey (BHPS) to estimate that the marginal propensity to consume for highly-leveraged households is 0.4 when housing prices fluctuate, while the marginal propensity to consume for households with very low debt-to-asset ratios is zero. Using the same data, Disney, Gathergood, and Henley (2010) studied the impact of unpredictable housing asset gains on consumer spending behavior in the UK real estate market. They found that the unpredictable positive trend of housing assets fluctuates between 0.09 and 0.14. They found that the positive fluctuating marginal propensity to consume caused by unpredictable housing assets was between 0.09 and 0.14. Therefore, the impact of rising or falling housing prices on consumer spending behavior is symmetrical. Waldron and Zampolli (2010) established a family generation overlap model based on the British family microdata. They attempted to explain the changes in household debt structure and the increase in housing prices in the UK from 1987 to 2006 through demographic characteristics, lower inflation rates, and long-term low real interest rates. The results show

that lower real interest rates are more likely to explain this problem. If the family expects lower real interest rates to persist, the model can better explain the increase in liabilities and explain the increase in most housing prices. However, the model also shows that the unexpected decline in real interest rates will cause a substantial increase in consumer spending, but this problem is not clearly reflected in the data.

There are also other studies that indicate the asymmetry of consumer spending. Engelhardt (1996) used PSID data from 1984 to 1989 to study US housing prices and homeowners' savings behavior. Berben, Bernoth, and Mastrogiacomo (2006) used Dutch data to study the impact of financial asset losses or gains on household saving behaviors and durable goods consumption expenditures. The results all indicate that the family's response to asset losses is greater than the response to asset gains. This may be due to the existence of concave or liquidity constraints in the consumption function under the motivation of preventive savings. These studies have all gained important policy conclusions. Firstly, if the family's response to asset losses is greater than the response to asset gains, the depression in the real estate market may have very serious consequences for consumer spending, especially for many European countries that generally own home ownership and liabilities. Secondly, if the effect of housing assets is indeed greater than the effects of financial assets, the consequences of the stock market recession may not be as serious as the consequences of the real estate market recession.

(3) The impact of age on consumer behavior

In recent years, with the continuous deepening of economic system reforms, China's economy has continued to grow at a rapid rate. However, rapid economic growth has been accompanied by a rapid increase in the savings rate of Chinese residents. The lack of consumer demand and high savings rate have been one of the major problems that have plagued China's

macroeconomic operations. Although the government can lower public savings rates by designing and implementing public policies that stimulate household consumption based on economic theory. However, according to the LCHs of Modigliani and Brumberg (1954), individuals will smooth their consumer expenditures over a long period of time based on lifetime expected income to achieve the optimal allocation of consumption throughout the life cycle. That is, the proportion of people in different age groups in the entire society will affect the country's total consumption and total savings. Individuals will also have different characteristics of consumption expenditure and savings at different ages.

The traditional way to study the impact of demographic factors on consumer spending (or savings) is to use macroeconomic perspectives and the life cycle model to study the relationship between population age structure and consumer spending and savings. Modigliani (1970) pointed out that when the rate of population growth changes, the population of different age groups grows at different rates. There is no correlation between the current economic growth rate and the population structure and savings rate. Therefore, when studying the influence of population factors on the savings rate, it is more appropriate to adopt a direct measurement of the population structure than the population growth rate. What actually affects the savings rate is the demographic structure, especially the ratio of the working population to the non-working population is the most important. The ratio of the retired population (65 years old and above) and the population of the minors to the working population has a significant negative effect on the savings rate. Loayza et al. (2000) showed that raising the ratio of minors and elderly people has a negative impact on the savings rate. A 3.5% increase in the minor dependency ratio will reduce the savings rate by 1%. When the old-age dependency ratio rises by 3.5%, the savings rate will drop by 2%.

Research by Borsch-Supan and Winter (2001) shows that the aging of the

population is having a strong impact on industrialized countries, and this trend will have a major impact on the capital market. Bloom and Canning (2008) believe that when a generation of baby boomers enters the labor market and begins to save for future retirement, the shift from high mortality and high fertility to low mortality and low fertility is beneficial for the economy. In addition, the study also pointed out that the realization of the potential benefits associated with the demographic transition depends on institutional and policy factors, which require the productive use of the potential labor force and the new savings rate brought about by the demographic transition. At the same time, changes in the age structure of the population are considered to be the central factor in the recent increase in the saving rate and economic growth of Asian countries (Higgins and Williamson, 1997).

However, the change in the dependency ratio is due to the continuous growth of the individual's age and the constant changes in the population of all age groups. Therefore, it is necessary to analyze the age effect of consumer behavior, not only can we further understand the influence of population factors on consumer behavior, but also make the design of public policy more targeted. Jappelli et al., (2003), and Demery and Duck (2006) conducted a more nuanced analysis of the age-effect of savings rates, resulting in a trend that savings rates vary with the age of household heads (or individuals).

In addition, there are differences in the income effects and asset effects of different age groups. Bover (2005) used the least squares and the instrumental variable method respectively to analyze the consumption equations by different age groups. The results of the study show that young household heads have little effect on assets. Households whose household heads are between 35 and 44 years of age have large asset effects, while those whose household heads are older than 44 years have significantly declined asset effects.

2.2 Government Expenditure and Resident Consumption

From Adam Smith's theory of effective demand to Malthus's elaboration on the relationship between effective demand and government expenditure, and Keynesian government intervention theory of “visible hand”, theoretical research on consumer demand has achieved a leap-forward development. The traditional Keynesian theory believes that increasing government spending can have a multiplier effect on private demand and the national economy. However, in theory, the relationship between government consumption and private consumption can be complementary, that is, private consumption increases with increasing government expenditure. At this time, the increase in government expenditure has a positive impact on private consumption. Conversely, the two can also be alternative relationships, that is, the expansion of government spending has a crowding effect on private consumption demand. Similarly, the consumption of private goods and public goods may also have alternative or complementary properties.

Bailey (2001) proposed that public goods and services provided by the government are equal to $\theta(0 < \theta < 1)$ units of goods for private consumption. According to this hypothesis, the consumer's utility function is $U = u(c + \theta g)$, $U' > 0$, $U'' < 0$, and $\partial(\partial u / \partial c) / \partial g = \theta U''$. Therefore, if there is $\theta > 0$, and $\partial(\partial u / \partial c) / \partial g > 0$, that is, the increase in government spending has caused the marginal effect of private consumption to decline, which has led to a reduction in private consumption, indicating that there is an alternative relationship between government expenditure and private consumption. If, on the contrary, there is $\theta < 0$, then $\partial(\partial u / \partial c) / \partial g > 0$. Subsequently, Western scholars then used Bailey's groundbreaking research to apply different empirical data and theoretical assumptions to examine the relationship between government expenditure and private consumption through in-depth

examination of the symbol of θ . Among them, since the 1990s, there have been more and more studies on esoteric mathematical models and metrology tests.

Part of the study focuses on the micro-consumer foundation for studying the role of fiscal policy from the level of household consumption, and has become an important aspect of studying the effectiveness of a stable fiscal policy. From the perspective of the development of economics, Ricardo's thought is exactly the opposite of Keynes's demand management theory. Therefore, testing the validity of Ricardo's ideas has become the basis and premise for testing the effectiveness of a stable fiscal policy. However, existing research has not reached a consensus on this. Kormendi (1990), on the assumption that the government budget is balanced, points out that debt financing or taxation of fiscal expenditure has no effect on the total social demand level. However, Ahemd (1986) found that regardless of the meaning and explanation of wealth and output on the government's temporary expenditures and persistent expenditures, it would have a crowding-out effect on residents' consumer spending. Since then, Modigliani and Sterling (1990) and Graham (1995) have challenged Kormendi's (1983) study in various ways. It can be seen that the relevant changes in fiscal policy will affect the consumption level of residents in some ways, and this to some extent negated the Ricardo neutral consumption hypothesis.

On the one hand, some studies suggest that government expenditures and private consumption are alternatives to each other, that is, government expenditures are squeezed out of private consumption.

Feldstein (1982) believes that if the government's consumption of goods or services completely replaces private consumption, there is a complete ex ante squeeze-out effect, that is, the government's increase in consumption of consumer goods will lead to an equal decrease in private consumption expenditure. Aschauer (1985) used the long-term income decision model to

empirically study empirical data in the United States and found that there is a significant alternative relationship between government expenditure and household consumption. Ahmed (1986) found that in the intertemporal substitution model, British government spending has squeezed private consumption to a certain extent.

Ahmed and Yoo (1995) studied under the framework of the real economic cycle, and Amano and Wirjianto (1997) used the relative price method to estimate the cross-substitution elasticity of US government expenditure and household consumption, Both have further proved that government spending and private consumption are alternatives to each other. Tsung-wuHo (2001) used panel data to study the relationship between government spending and household consumption in 24 OECD industrial countries. It is found that there is no regular result between government expenditure and household consumption in a single country, but the results of panel cointegration analysis on multinational data show that government expenditure has a clear alternative relationship to household consumption. Studies by Romer (2007) have shown that in most cases, with the dramatic increase in fiscal expenditure, especially in military spending during a specific period, both consumption and real wages have declined, although output has increased. Perotti (2011) uses the quarterly data and annual data of several OECD countries to conduct a comparative study of the relationship between fiscal expenditure and household consumption. It turns out that the results of the study based on quarterly and annual data are inconsistent, and that private consumption after the 1980s was largely squeezed out by government spending.

On the other hand, it is also pointed out that government expenditure is complementary to private consumption, that is, government expenditure is squeezed into private consumption.

Through the use of empirical data in many countries, Karras (1994) found

that between government spending and household consumption, there are not substitutes but complementary relationship. And the degree of complementarity is positively related to the size of the government, that is, the increase in government expenditure will increase the marginal utility level of household consumption, and then increase the level of residents' consumer spending. Devereux et al. (1996) argued that government spending will endogenously increase labor productivity, thereby increasing private real wages and consumption. Molana (1997) used the extended life cycle model to study the relationship between private consumption and public consumption based on the substitution between public goods and private goods and the degree of consumer concern about how the government compensates for fiscal deficits. It believes that changes in government spending have different levels of squeeze-in effect on the consumption of durable goods and non-durable goods in private consumption. Fatas and Mihov (2001) used structural vector autoregressive methods to examine the relationship between government fiscal expenditure and household consumption. The results of the study show that fiscal expansion will lead to a significant increase in household consumption and will also increase output. Shclarek (2004) found that government consumption has a Keynesian expansion effect on residential consumption in industrialized countries and developing countries, but there is no evidence to support the crowding out effect of government spending on household consumption. In 2007, he further used the panel data of 21 industrialized countries and 19 developing countries to empirically test the impact of fiscal policy on private consumption demand. The result shows that the government consumption shock has a Keynesian effect in both industrialized and developing countries. Giordano et al. (2007) used the same method to study the situation in Italy from 1982 to 2004 and found that the impact of fiscal expenditure has a positive impact on household consumption, and a 1% fiscal impact can increase private GDP by 0.6%.

In addition, some scholars believe that fiscal spending does not have a significant effect on private consumption demand. Perotti (2004) used SVAR's method to examine OECD countries and found that in the 1980s and 1990s, the impact of fiscal expenditure on household consumption was not significant. Using the same method, Mountford and Uhlig (2005) conducted research on the basis of US quarterly data and found that the impact of government fiscal expenditure will squeeze out investment, but it is difficult to change household consumption. Heppke-Falk et al. (2010) used the SVAR method for German studies to show that a direct government fiscal shock would increase output, but the increase in household consumption was not statistically significant.

2.3 Opening to the outside world and Resident Consumption

In terms of the impact of opening up on the level of resident consumption: Janson (2006) found that after Spain joined the European Community, it experienced an upsurge of consumption and believed that international trade had a positive impact on domestic consumption levels. Based on survey data, analysis by Lyon and Ailshire (2014) shows that trade, especially fair trade, is an important factor affecting personal consumption. The lack of fair trade will limit the growth of consumption.

In addition, most scholars study the impact of opening up on the level of household consumption from the perspective of over-sensitive consumer spending. The over-sensitivity of residents' consumption mainly refers to the positive correlation between consumption in this period and lagged income (Flavin, 1981; Deng and Jin, 2008). Ostergaard (2002) and others believe that the breadth and depth of trade liberalization is an important reason for the excessive sensitivity of resident consumption. Dejuan and Luengo-Prado (2006) verified the impact mechanism of the closed economic constraint

hypothesis using the sample data from the regional level in the UK, Germany, Italy, west, Japan, the United States and Canada. They found that the higher the level of openness of trade is, the smaller the over-sensitivity of residents' consumption will be, namely, the negative correlation between trade openness and over-sensitivity of consumption.

In summary, it can be seen that the existing studies focusing on the impact of trade liberalization on the level of household consumption are still relatively small. In particular, at present, with the widespread development of global economic integration, international trade has exerted increasingly far-reaching effects on China's economic growth, income distribution, consumption, and even the environment. Therefore, it needs further exploration.

3. Theoretical model

In the existing literature, Barro (1990) proposed a model that can study the influence of government activities on consumption. It mainly studies the scale of local government expenditure, namely, the impact of the proportion of local government expenditure to local GDP on the consumption. The theoretical model of this dissertation mainly draws on its ideas and extends it. Specifically, similar to Barro's theory, we introduced the scale of local government expenditure as one of the economic variables for measuring local government activities. Next, we follow Barro's theory to establish a corresponding theoretical model.

In the model of this dissertation, we demonstrate that local government activities can be seen as an influence on the balanced growth path of the

corresponding consumption. In addition, the activities we consider mainly refer to the impact of local government activities on economic activities, and use them as exogenous variables, which have an impact on the enterprises in the region, thus affecting the level of household consumption in the region.

Let G represent government spending, in the usual AK model, since A represents the level of technology. The opening-up can effectively absorb advanced foreign technology, so it is said that opening-up can reflect the level of technology to a certain extent. Therefore, we assume that "Open" represents the degree of openness to the outside world, and that the level of technology A has the following relationship with the degree of openness - "Open":

$$A = A' e^{open} \quad (1)$$

Among them, A' is a factor that affects the technological level beyond opening-up, and $A' > 0$.

We borrow from Samuelson's (1954) standard analysis of public goods, assuming that G is non-competitive and non-exclusive. Therefore, each company can use all G , and its use by one company does not reduce the amount that other companies can use.

We assume that, as Barro's theory shows, the production function of firm i takes the form of Cobb-Douglas's production function:

$$Y_i = A \times L_i^{1-\alpha} \times K_i^\alpha \times G^{1-\alpha} \quad (2)$$

Among them, $0 < \alpha < 1$, this formula means that each company's production shows a constant scale of compensation for L_i and K_i . We assume that the total labor force L is constant. For a fixed G , the accumulation of total capital K has diminishing returns. But if G increases as K increases, then there will be no diminishing returns. This shows that for a fixed L_i , the production

function K_i and G have a constant reward effect. So, just like the AK model, the economy can achieve endogenous growth.

If the index of G in formula (2) is less than $1-\alpha$, the rewards of K_i and G will decrease, and these diminishing returns indicate that endogenous growth will not occur. In turn, if the index is greater than $1-\alpha$, the growth rate will tend to continue to rise. Therefore, we focus on the special case of G is exactly equal to $1-\alpha$. At this time, the constant remuneration of K and G means that the economy can achieve endogenous growth. In addition to the total capital stock K replaced by government expenditure G , this framework is similar to the Romer model's production function.

Substituting equation (1) into equation (2), we can obtain:

$$Y_i = A' e^{open} \times L_i^{1-\alpha} \times K_i^\alpha \times G^{1-\alpha} \quad (3)$$

We convert formula (2) into a per capita form of capital. We can obtain:

$$Y_i = A \times L_i \times k_i^\alpha \times G^{1-\alpha}, \quad \text{其中 } k_i = \frac{K_i}{L_i}. \quad (4)$$

Assume that local governments provide corresponding local government expenditures based on the total paid head tax. Therefore, for each given G , for each company pursuing profit maximization, it will make the marginal output of its capital equal to the rental price of its capital, that is, $r + \delta$. Among them, r is the interest rate, and δ is the depreciation rate of capital. Therefore, from equation (2) we can draw:

$$\alpha \times A \times k_i^{1-\alpha} \times G^{1-\alpha} = r + \delta \quad (5)$$

According to formula (5), each company chooses the same capital-labor ratio, $k_i = k$. Therefore, equation (4) can be added to:

$$Y = A \times L \times k^\alpha \times G^{1-\alpha} \quad (6)$$

It can be launched:

$$G = \left(\frac{G}{Y} \right)^{\frac{1}{\alpha}} \times (A \times L)^{\frac{1}{\alpha}} \times k \quad (7)$$

Below, we will consider the issues of social planners. We assume a lifetime utility function for an indefinite representative family:

$$U = \int_0^{\infty} e^{-\rho t} \times \frac{c^{1-\theta}}{1-\theta} dt \quad (8)$$

In social planners' issues, social planners choose c , k , and G to maximize the usefulness of a representative family. This question is equivalent to:

$$\max U = \int_0^{\infty} e^{-\rho t} \times \frac{c^{1-\theta}}{1-\theta} dt$$

Then we can get:

$$\dot{k} = A \times k^{\alpha} \times G^{1-\alpha} - c - \delta k - \frac{G}{L} \quad (9)$$

Among them, the intertemporal substitution elasticity is $1/\theta$, δ is the depreciation rate for capital use, ρ is the discount rate, c refers to the per capita consumption expenditure of representative households, k is the per capita capital stock of a representative family. For this maximization issue, we use the Hamiltonian method of optimal control to solve. The corresponding Hamiltonian function is:

$$H = e^{-\rho t} \times \frac{c^{1-\theta}}{1-\theta} + \mu \times \left(A \times k^{\alpha} \times G^{1-\alpha} - c - \delta k - \frac{G}{L} \right), \quad (10)$$

Its first-order conditions are:

$$\frac{\partial H}{\partial c} = 0 \Rightarrow e^{-\rho t} \times c^{-\theta} = \mu \quad (11)$$

$$\frac{\partial H}{\partial G} = 0 \Rightarrow A(1-\alpha) \times K^\alpha \times G^{-\alpha} = \frac{1}{L} \quad (12)$$

$$\frac{\partial H}{\partial k} = -\rho \Rightarrow \mu \times (A\alpha k^{\alpha-1} \times G^{1-\alpha} - \delta) = \rho \mu \quad (13)$$

$$\lim_{t \rightarrow \infty} \mu(t) \times k(t) = 0 \quad (14)$$

The equation (14) is the cross-sectional condition, taking the logarithm of both sides of equation (11) and taking the derivative of t, we can obtain:

$$-\frac{\dot{\mu}}{\mu} = \rho + \theta \frac{\dot{c}}{c} \quad (15)$$

Substituting equation (15) into equation (13), it can be obtained:

$$\frac{\dot{c}}{c} = \frac{\alpha A \times k^{\alpha-1} \times G^{1-\alpha} - \delta - \rho}{\theta} \quad (16)$$

$$\frac{\dot{c}}{c} = \frac{\alpha A \times \left(\frac{G}{Y}\right)^{\frac{1-\alpha}{\alpha}} \times L^{\frac{1-\alpha}{\alpha}} - \delta - \rho}{\theta} \quad (17)$$

$$c(t) = c(0) \times \exp \left\{ \frac{1}{\theta} \left[\alpha A^{\frac{1}{\alpha}} \times \left(\frac{G}{Y}\right)^{\frac{1-\alpha}{\alpha}} \times L^{\frac{1-\alpha}{\alpha}} - \delta - \rho \right] \times t \right\} \quad (18)$$

$$c(t) = c(0) \times \exp \left\{ \frac{1}{\theta} \left[\alpha (A' e^{open})^{\frac{1}{\alpha}} \times \left(\frac{G}{Y}\right)^{\frac{1-\alpha}{\alpha}} \times L^{\frac{1-\alpha}{\alpha}} - \delta - \rho \right] \times t \right\} \quad (19)$$

The above theoretical model shows that government expenditure and openness have a positive effect on the level of household consumption. But this is only illustrated by Barro's theory of economic growth. We also need to examine it in light of China's actual conditions. This needs to be analyzed in the later model of measurement. In addition, China has a vast territory and the economic development in different regions is not the same. The most important difference in regional development is the difference between the eastern, central and western regions. The difference between the eastern, central and western regions is a combination of many factors, mainly including the following: basic factors, institutional factors, cultural factors, demographic factors, and geographical factors. Specifically:

The Basic factor mainly means that thanks to the policy of reform and opening up, the eastern region is at the forefront of reform and opening up. The industrial layout is also mainly concentrated in the eastern coastal areas and the middle and lower reaches of the Yangtze River, which makes the economic growth rate of the eastern region higher than that of the central and western regions, and the imbalance is prominent.

The Institutional factors mainly refer to the unbalanced nature of the institution in the eastern, central and western regions, especially various formal institution.

The Cultural factors are reflected in the cultural differences in the eastern, central and western regions. The eastern coastal areas have a regional culture with certain adventurous spirits. In contrast, the cultural concepts in the central and western regions are mostly conservative and passive, leading to cultural differences among regions.

The population factor is one of the important sources of economic growth. The difference in population factors has greatly affected the efficiency of expanding reproduction.

Geographical factors cause differences in the East, Central, and West regions through direct and indirect methods. The indirect approach refers to indirectly affecting the regional economy through influencing culture, population, and basic factors.

In summary, the combined effects of various factors have caused a serious imbalance in the development of the eastern, central and western regions, which must be taken into account in our research. In view of this, we need to consider not only the impact of the scale of local government spending across the country and opening up on the level of household consumption. At the same time, we also need to consider separately the impact of the scale of local government spending and the opening up in different regions of the East, Central and West on the level of household consumption.

The conclusions obtained from the previous theoretical model have certain implications for studying the influence mechanism of the scale of local government expenditure and the opening up on residents' consumption in different regions. According to (19), it can be seen that government expenditure and openness to the outside world have a positive impact on the level of household consumption. Specifically, we can see from equation (19) that, as $0 < \alpha < 1$, then $1 - \alpha > 0$. This shows that the government expenditure index is positive. And because the elasticity of substitution between two phases of consumption is $\theta > 0$, government expenditure G/Y has a positive effect on per capita consumption c . In view of this positive effect, this dissertation proposes the following hypothesis to be examined when studying how the scale of local government expenditure in different regions affects household consumption:

Hypothesis 1: Under the control of other influencing factors, the expansion of the scale of local government expenditure will increase the level of household consumption in a region.

From (19), we can also see that because $A' > 0$ and $0 < \alpha < 1$, $\theta > 0$, the open degree “open” affects the per capita consumer expenditure c positively through the e -base exponential function. Based on the above analysis, this dissertation proposes a second hypothesis to be tested when studying how opening to the outside world affects residential consumption in different regions:

Hypothesis 2: Under the control of other influencing factors, the deepening of the degree of opening to the outside world will increase the level of household consumption in a region.

Based on the above two assumptions, we can get the following theoretical model:

$$consume_{it} = \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} \quad (20)$$

Among them, $consume$ indicates the level of household consumption, $govscale$ indicates the scale of local government expenditure, and $open$ indicates openness to the outside world.

The above hypothesis is to study the impact on local residents' consumption levels from the two independent perspectives of local government expenditures and opening up. The two significant features of China's economic growth over the past 30 years since its reform and opening up were the government's leading role in the economy and its opening to the outside world. Then, what is the role of the government leading role and opening up to China's economic growth in different regions? What is the mechanism of action between the two? The above are all questions that need to be clarified when analyzing China's economic growth. However, there are still few studies on the internal causes of China's transitional growth model at home and abroad. The two distinctive features of China's transitional growth model since the reform and opening up were precisely the government's leading role in the economy and its opening to the outside world. The

interaction between the two is also significant. Therefore, this dissertation wants to put together the government's role and opening up to analyze the combined effects of the two on the level of household consumption.

Given the relationship between the government's role and opening to the outside world under China's transformational growth model since its reform and opening up, we cannot help but have a question: Will the two have a "complementary effect" in affecting the level of residents' consumption? Two distinctive features of China's economic growth model over the past three decades of reform and opening up have been the government's leading role in the economy and opening up to the outside world. The interaction between the two will have a significant impact on the level of household consumption. On the one hand, the government has undoubtedly played an important role in the process of China's opening to the outside world. It has effectively promoted opening up to the outside world. In the process, with the expansion of the size of government expenditures (mainly infrastructure expenditures), the degree of opening to the outside world has also deepened. The opening to the outside world also enabled China to learn from the world, expand international economic and trade exchanges, and actively participate in economic globalization, thus winning the unprecedented development and prosperity of the open economy, which is conducive to the improvement of the level of resident consumption. On the other hand, the deepening of the degree of openness to the outside world has also stimulated an increase in public spending by the government, which has increased the positive effect of government expenditure on household consumption. Based on the above analysis, we propose the third hypothesis to be tested:

Hypothesis 3: There is a complementary relationship between local government expenditures and opening to the outside world in terms of influencing regional household consumption levels. It is true that the complementary relationship between the size of local government

expenditures and the opening up to the outside world in the process of jointly affecting household consumption levels is only a guess, and the following empirical tests are still needed to test it. To test whether Hypothesis 3 is established, we need to further introduce the cross-term “govscale*open” of the scale of local government expenditure and opening to the outside world.

In this way, we can obtain theoretical model expressions that include the cross-term of the scale of local government expenditure and opening to the outside world:

$$consume_{it} = \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} + \beta_3 govscale_{it} \times open_{it} \quad (21)$$

If the estimated coefficient of the cross item is greater than 0, it indicates that the local government expenditure and the opening to the outside are complementary to each other in the impact on the level of household consumption, and vice versa. It should be pointed out that we will verify Hypothesis 1, Hypothesis 2 and Hypothesis 3 separately across the country and in the East, Central, and West Regions.

4. Empirical model and data resource

4.1 Empirical model

The research of this dissertation is mainly to examine the influence of local government behavior and opening up on the consumption level of Chinese residents. This study will use empirical research methods to explore the impact of the scale of local government expenditure and the degree of openness of the local economy on the level of local residents' consumption. The sample range of this article is China's 30 provincial administrative units (except Tibet), and according to the division of eastern, central and western regions, we conducted separate studies on the three regions. In the corresponding study of the level of resident consumption, we must first

examine the direct effect of the scale of local government expenditure and the degree of openness on the consumption levels of residents across the country and the eastern, central and western regions. We also need to further examine the mutual effect of the scale of local government expenditures and the degree of openness on the overall consumption of residents in the country and the eastern, central and western regions. Therefore, based on the theoretical model (20), we constructed an econometric model to reflect the impact of local government expenditure scale and openness on the consumption levels of the local government in the whole country and in the eastern, central and western regions, respectively. It is expressed as follows:

$$consume_{it} = \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} + \mu_i + \varepsilon_{it} \quad (22)$$

Next, we will consider the mutual effect of the scale of local government expenditure and the degree of openness on the level of household consumption in different regions. Based on the theoretical model (21), we added the cross item “govscale*open” of the scale of local government expenditure and openness to the measurement model (22), and obtained the following model:

$$consume_{it} = \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} + \beta_3 govscale_{it} \times open_{it} + \mu_i + \varepsilon_{it} \quad (23)$$

Among them, i denotes the region, t denotes time, our sample includes 30 mainland provinces, municipalities and autonomous regions of China except Tibet, and the selected time period is from 2012 to 2016. $Consume$ represents the level of household consumption in each province, $govscale$ represents the scale of local government expenditure, $open$ represents the degree of openness of each province, and μ_i is an intercept that represents the heterogeneity of individuals and is a perturbation that changes with individuals and time. In addition, we add some control variables to get more

accurate results. According to relevant research literature, we mainly consider the following three variables as other important factors affecting the level of household consumption: Urbanization rate (rpu), industrialization (industry), and per capita GDP (income).

Therefore, the final measurement model of this dissertation is revised as:

$$\begin{aligned} consume_{it} = & \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} + \\ & + \beta_3 rpu_{it} + \beta_4 industry_{it} + \beta_5 income_{it} + \mu_i + \varepsilon_{it} \end{aligned} \quad (24)$$

After introducing the cross terms of the scale of local government expenditure and the degree of openness to the outside world, the revised measurement model is as follows:

$$\begin{aligned} consume_{it} = & \alpha + \beta_1 govscale_{it} + \beta_2 open_{it} + \beta_3 govscale_{it} \times open_{it} \\ & + \beta_4 rpu_{it} + \beta_5 industry_{it} + \beta_6 income_{it} + \mu_i + \varepsilon_{it} \end{aligned} \quad (25)$$

4.2 Variable Selection

(1) Level of household consumption

Considering that the variable of consumption in the theoretical model mentioned earlier is per capita consumption expenditure, we divide the total expenditure of household consumption by the total number of people to represent the level of household consumption. Furthermore, since the data obtained is of a larger magnitude, it is then divided by 10,000 to obtain the data used. Among them, the greater the value is, the higher the level of household consumption will be.

(2) Core explanatory variables

The scale of local government expenditure. We use the proportion of local government fiscal expenditure to the regional GDP to measure the scale of local government expenditures to express the participation of local

governments in economic activities. According to the previous theoretical analysis, the larger the value of this variable is, the greater the degree of local government intervention in economic activities will be, the more it can raise the level of national consumer spending. The regression coefficient of this variable may be positive, but this is the conclusion drawn by Western economic growth theory. Whether this conclusion is applicable to different regions in China still remains a question. Therefore, we still need to use China's provincial panel data later in this study and test it through quantitative analysis.

Openness to the outside world. Another focus of this study is the impact of opening up on the level of household consumption. Therefore we need a core explanatory variable that can measure openness to the outside world. We use the year-to-date ratio of total imports and exports at the midpoint between the US dollar and the RMB as a percentage of the regional GDP as a measure of openness to measure opening to the outside world. As the opening up to the outside world has significantly promoted the development of China's national economy in the past 30 years, it has also increased the level of household consumption. Therefore, considering the previous estimation and the previous theoretical analysis, we expect the regression coefficient of this variable to be positive. Of course, the situation may not be the same in different regions, which remains to be verified.

(3) Control variables

Urbanization rate (*rpu*). This study uses the proportion of urban population to the total population to measure the urbanization rate. Urbanization is closely related to the level of economic development in a region, which in turn affects the level of household consumption.

Industrialization (*industry*). This study uses the industrial output value as a percentage of regional GDP to measure the level of industrialization. The level

of industrialization also reflects the level of economic development in a certain area, which is also related to the level of household consumption.

Per capita GDP (income). In general, the higher the GDP per capita is, the higher the level of economic development in the region will be, and thus the level of household consumption in the region will be affected.

4.3 Data Sources

In order to maintain the neatness of the variables, we finally selected panel data for 30 provinces, municipalities, and autonomous regions in China except Tibet for 2012-2016 as an analysis sample. Table 1 reports the statistical characteristics of the main variables.

Table 1 Variable description statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
consu	150	0.468	0.206	0.204	1.412
govscale	150	0.228	0.177	0.079	1.379
open	150	0.309	0.379	0.034	1.711
rpu	150	0.515	0.147	0.207	0.896
industry	150	0.383	0.097	0.068	0.530
income	150	10.093	0.752	8.089	11.680

5. Results

Since this article needs to consider the relationship between the scale of local government expenditure, the degree of openness, and the level of household consumption throughout the country, it also needs to consider the above relationships in various regions of the East, Central and West. Therefore, we conducted quantitative analysis regarding the whole country and the eastern and western regions respectively.

5.1 National scope

In this section, when examining the relationship between the size of local government expenditures, the degree of openness, and the level of household consumption across the country, a panel of ordinary least-squares methods is used to give preliminary estimates.

Table 2 Results of national sample empirical model.

	OLS	FE	RE
Govscale	3.054*** (6.03)	3.761*** (6.74)	2.347*** (5.06)
Open	5.417*** (5.98)	3.618*** (3.44)	4.961*** (5.99)
Rpu	2.023*** (3.47)	2.149*** (3.71)	1.738*** (3.13)
Industry	-0.179 (-0.24)	-2.224 (-1.72)	-2.029 (-3.10)
Income	2.996 (5.37)	2.209 (4.39)	2.217 (4.78)
Gov open	0.276 (0.33)	0.199 (0.95)	0.235 (1.05)
Cons	3.873*** (18.04)	3.743*** (11.38)	2.857*** (14.54)
<i>Province-fixed effect</i>	NO	Yes	NO
<i>Year fixed effect</i>	NO	Yes	NO
<i>BP-LM test</i>			1983.6 (0.000)
<i>Hausman test</i>			6.83 (0.216)

<i>R</i> ²	0.653	0.957	0.977
<i>N</i>	150	150	150

The results are reported in columns (1), (2), and (3) of Table 2. For ease of comparison, the estimated result of Pooled least square is given in column (1). Then the fixed effect (FE) and random effect (RE) estimation results are reported in columns (2) and (3), respectively. The Breusch-Pagan LM test indicated that the RE model was more appropriate than the mixed OLS, so mixed regression could not be used. Finally, in order to compare the applicability of fixed effects and random effects models, we further conducted the Hausman test and found that the original hypothesis could not be rejected at the 10% level, indicating that random effects models should be used.

Next, we analyze the regression results based on the random effects model. The size of local government spending has a positive effect on the level of household consumption in the country, and it is significant at the 1% level. This is consistent with the relationship shown in Figure 1, thus supporting Hypothesis 1. The coefficient of openness is positive, and significant, that is, the degree of openness has increased the level of household consumption. Hypothesis 2 has been confirmed here. In the control variables, the urbanization rate and per capita GDP have a positive effect on the level of household consumption, and both are significant at the 1% level, while the industrialization level negatively affects the household consumption level at the 1% level.

5.2 Eastern, Central and Western Regions

Next, this section will examine the above relationships in various regions of the East, Central and West. In this section, the Hausman test was conducted separately for the eastern, central, and western regions. It was found that the original hypothesis could not be rejected at the 10% level in the east and the west, and the original hypothesis was highly rejected at the 1%

level in the middle. This shows that both the east and the west should use the random effects model, and the middle should use the fixed effect model. Among them, the corresponding results in the east, middle, and west regions are reported in columns (1), (2), and (3) of Table 3, respectively. The Breusch-Pagan LM test in the east and west regions indicates that the RE model is more appropriate than the corresponding mixed OLS. So we analyze the obtained regression results on the basis of the corresponding FE or RE models in the eastern, central, and western regions, respectively.

Table 3 The regression results of regional empirical models.

	Eastern China	Central China	Western China
Govscale	-1.054*** (-6.03)	3.761*** (6.74)	2.347*** (5.06)
Open	0.417*** (5.98)	0.618*** (3.44)	0.961*** (5.99)
Rpu	0.153*** (0.127)	0.169*** (0.421)	0.178*** (0.215)
Industry	-0.823* (-1.34)	-0.264* (-1.66)	-0.431* (-1.08)
Income	2.432*** (5.37)	2.351*** (4.39)	2.307*** (4.78)
Gov open	0.254 (0.63)	0.162 (0.85)	0.211 (0.67)
Cons	2.787*** (9.48)	3.579*** (14.12)	3.366*** (8.64)
<i>Province-fixed effect</i>	NO	Yes	NO
<i>Year fixed effect</i>	NO	Yes	NO
<i>BP-LM test</i>	402.45 (0.000)		387.43 (0.000)
<i>Hausman test</i>	5.54	28.13	4.81

	(0.3533)	(0.000)	(0.586)
<i>R</i> ²	0.915	0.942	0.963
<i>N</i>	150	150	150

Next, we analyze the obtained regression results on the basis of the corresponding FE or RE models in the eastern, central, and western regions, respectively.

Firstly, we analyze the RE model in the eastern region. The scale of local government expenditure has a negative effect on the level of household consumption, and it is significant at the 1% level. This shows that Hypothesis 1 is not applicable in the eastern region. The coefficient of openness is positive, and it is significant at the level of 1%, that is, opening up to the outside world has increased the consumption level of residents in the eastern region. Hypothesis 2 has been confirmed here. Among the control variables, urbanization and per capita GDP have positive effects on the level of household consumption. Among them, urbanization is not significant, and per capita GDP is significant at the 1% level. The degree of industrialization has a significant negative impact on the level of resident consumption at 5%.

Secondly, we analyzed the FE model in the central region. The scale of local government expenditure has a positive impact on the level of household consumption and is significant at the 1% level. The coefficient of openness is positive, but not significant. Among the control variables, the impact of urbanization and per capita GDP on household consumption levels is significantly positive at the 1% level, while industrialization levels have no significant negative effect on household consumption levels.

Finally, we analyze the regression results of the RE model in the western region. The scale of local government expenditure has a positive effect on the level of household consumption, and is significant at the 10% level. This shows that Hypothesis 1 applies in the western region. The coefficient of

openness is significantly positive at the 10% level, and hypothesis 2 applies equally to the western region. The sign of the control variable coefficient is consistent with the East and Central regions, and all are significant.

6. Conclusion

This dissertation expands Barro's theoretical model based on the actual situation in China. Through theoretical analysis and empirical research, this dissertation not only studies the direct effect of local government expenditures and the impact of opening up on residents' consumption levels in the whole country and the eastern, central and western regions, but also studies the interaction effects of the two on household consumption levels in various regions. This dissertation constructs a theoretical model of local government spending and opening up to influence the level of household consumption, and puts forward three hypotheses, and empirically analyzes the inter-provincial panel data of China from 2012 to 2016. The main conclusions we have are:

(1) Under the control of other factors, the expansion of the scale of local government expenditure in terms of the nationwide scope is conducive to raising the level of household consumption. As far as the eastern, central and western regions are concerned, the scale of local government spending in the central and western regions has a significant positive impact on the level of household consumption, while the expansion of the scale of local government expenditure in the eastern region significantly impedes the improvement of household consumption levels. (2) Under the control of other factors, opening up to the outside world is conducive to raising the level of residents' consumption. (3) There is no significant complementary relationship between local government spending and opening to the outside world in all regions. (4) In addition, we also found that urbanization in different regions has a different impact on the level of household consumption. Industrialization in most cases

is not conducive to improving the level of household consumption. Per capita GDP has a significant positive effect on household consumption levels.

With the advent of the new international economic situation, especially after the impact of the international financial crisis, the expansion of domestic demand has become a realistic choice for the transformation of China's economic growth mode and sustainable development. The key to the sustained growth of China's economy is to stimulate domestic demand.

The research in this dissertation has certain enlightenment significance for the Chinese government to formulate relevant policies for stimulating household consumption levels: Firstly, the role of the government is not the same in different regions. For example, the economy in the central and western regions is relatively backward, and the government should expand its spending scale, which is conducive to stimulating economic growth and raising the level of household consumption. In the eastern region, the size of the government's expenditure should be controlled, otherwise it will impede the improvement of the level of household consumption and will not be conducive to sustained economic growth. Secondly, opening up to the outside world has a catalytic effect on all regions. This shows that there is a need for China to increase the intensity of opening to the outside world and effectively learn from and absorb advanced foreign technology and management experience.

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